

translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Rec'd PCT/PTO 02 FEB 2005  
PCT/DE2003/602446



Applicant's or agent's file reference 2002P11883WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/002446	International filing date (day/month/year) 21 July 2003 (21.07.2003)	Priority date (day/month/year) 02 August 2002 (02.08.2002)
International Patent Classification (IPC) or national classification and IPC H02K 55/04		
Applicant SIEMENS AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 28 October 2003 (28.10.2003)	Date of completion of this report 23 August 2004 (23.08.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

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## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages \_\_\_\_\_ 1-15 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_ 1-14 \_\_\_\_\_, filed with the letter of \_\_\_\_\_ 13 May 2004 (13.05.2004)
- ☒ the drawings:  
pages \_\_\_\_\_ 1/5-5/5 \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

## 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-14	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims		NO

### 2. Citations and explanations

#### 1). Reference is made to the following documents:

D1: US-A-6 129 477 (SHOYKHET BORIS A) 10 October 2000  
(2000-10-10) mentioned in the application  
D2: GB-A-2 051 303 (CELANESE CORP) 14 January 1981  
(1981-01-14).

#### 2). The subject matter of claim 1 does not involve an inventive step (PCT Article 33(3)) for the following reasons:

D1 discloses a machine 200

- comprising a rotor mounted so as to rotate about an axis of rotation,
- the rotor having a rotor external housing 209 which is secured to axial rotor shaft parts 204a, 204b and comprises a winding support 202 which has a winding 206 to be cooled,
- the rotor comprising means for holding the winding support inside the rotor external housing, said means comprising, at least on an end face of the winding support, a torque-transferring device which is located between the winding support and the associated rotor shaft part and which has at least one rotationally symmetrical composite body 212b made of a fibre-reinforced plastics material (see column 2, lines 50 to 57),

- the composite body containing integral side parts (the respective end sections of the composite body) and a central part located therebetween,
- the central part being designed as a hollow cylinder ("tube"),
- the composite body being connected at its side parts to flange-like metal fastening parts ("coupler ports", "end plates", see column 3, lines 2 to 7, 10 to 12 and 27 to 35),
- at least a portion of a central part of the composite body being left extensively free (see figures 1 and 5).

The subject matter of claim 1 differs from the machine as per D1 in that

- at least a partial section of the side parts is of outwardly flaring frusto-conical design,
- at least a partial section of the side parts have a corrugated form, viewed in the circumferential direction,
- the connection between side parts and fastening parts is positive and non-positive, in that, by means of a press ring body provided with a mating pressing surface which is to be non-positively connected to the corresponding fastening part, each side part can be releasably pressed onto a mating counter surface of the fastening part.

The subject matter of claim 1 is therefore novel (PCT Article 33(2)).

Because of the corrugated shape of the side parts matching the counter surface, a positive connection with particularly high shearing strength is achieved between the composite body and the fastening parts (see page 5, line 32 to page 6, line 2 of the present application), thus ensuring stable torque transfer. The high shearing strength is further increased in that the side parts and the fastening parts are

pressed against one another by means of the press ring.

In the machine described in D1 (column 1, line 17 to column 3, line 48), on the other hand, the connection between side parts and fastening parts is achieved by gluing (column 3, lines 19 to 23).

D1 describes a further machine wherein the connection between side parts and fastening parts is more stable in terms of torque transfer. Starting out from the machine in which the side parts and fastening parts are glued to one another, D1 proposes that the side parts and counter surfaces be of frusto-conical design, the shapes of the overlapping parts differing suitably from one another in order to increase the shearing strength.

The problem to be solved by the subject matter of claim 1 can therefore be considered that of indicating a machine having an alternative connection between side parts and fastening parts which is likewise stable in terms of torque transfer. The side parts should be made of a fibre-reinforced plastics material, as required in D1 in order to reduce heat transfer (see D1, column 2, lines 50 to 54), while the fastening parts should be made of metal.

Since the solution to the problem involves a connection between a composite body and a metal body which is stable to torque transfer, a person skilled in the art would take into consideration all the literature dealing with such connections, whatever the machines in which this connection is used and whatever other functions the composite body and the metal body have in these machines. It should be noted that the prerequisite for low heat transfer already exists, in that a composite body is used

(cf. also page 3, lines 22 to 28 of the present application).

D2 concerns the connection between a hollow shaft (composite shaft) made of composite material and a metallic fastening part (metallic coupling sleeve). The connection should be stable as regards torque transfer. D2 also proceeds from a connection in which the composite body is glued to the fastening part (page 1, lines 78 to 87). Consequently, a person skilled in the art would take D2 into consideration when solving the problem. D2 even explicitly mentions that the described connection can be transferred to other applications (see page 4, lines 44 to 49).

In order to increase the shearing strength of the connection, D2 proposes that

- a partial section (19) of the side parts of the composite body 12 be of inwardly flaring frusto-conical design and a partial section (23) be of outwardly flaring frusto-conical design (see page 2, lines 80 to 85 and figure 9),
- at least a partial section of the side parts be corrugated, viewed in the circumferential direction (see, e.g., page 4, lines 24 to 28),
- the connection between side parts and fastening parts be positive and non-positive, in that, by means of a press ring body 30 provided with a mating pressing surface which is to be non-positively connected to the corresponding fastening part, each side part can be releasably pressed onto a mating counter surface of the fastening part (see page 2, lines 99 to 106 and page 4, lines 9 to 16 and 28 to 31).

Thus, by transferring the connection described in D2 to the machine as per D1, a person skilled in the art

arrives at the subject matter of claim 1, without thereby being inventive.

It should be noted that, by pushing on the press ring, the side parts obtain a pressing surface which mates with the corrugated counter surface of the fastening part in such a way that the side parts and fastening parts intermesh and are thereby connected in a stable manner as regards torque transfer (see page 3, line 122 to page 4, line 2 and page 4, lines 24 to 28).

Furthermore, it should be noted that the side parts (consisting of the layers 42, 44, 46, 48) are necessarily corrugated both on the external surfaces and on the internal surfaces (see figure 2), because the surfaces of the fastening body and of the press ring facing the side parts are also corrugated (see figures 2 to 4 and page 3, lines 122 to 129). The corrugated shape of the press ring is clearly recognizable in D2, figure 3, has ridges 32 and recesses 34 and logically matches the corrugated shape of the fastening parts, because otherwise the side parts could not be pressed into the recesses in the fastening parts.

It should also be noted that the press ring 30 according to D2 contributes to the positive and non-positive connection of the side parts and fastening parts, even after the material of the side parts is cured (see page 4, lines 28 to 31). The connection can also be released by removing the press ring (see D2, page 4, lines 9 to 15). Optional additional gluing is provided both in D2 (see page 4, lines 40 to 43) and in the present application (see page 12, lines 14 to 22).

It should also be noted that according to D2 the frusto-conical shape of the side parts need not

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necessarily be doubled, as shown in figure 9 of document D2, which can be gathered, for example, from page 4, lines 32 to 36 and from a comparison of claims 1 and 6.

3). Industrial applicability is obviously established.



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